PATENT CLAIMS

1. Connecting device for connecting a first extruded hollow profile (10), having a profile channel (12) and at least one undercut groove space (22) on a longitudinal groove (20), to another workpiece by means of a screw element or other connecting member (50, 50_a, 50_n), characterized in that there is fixed to the hollow profile (10) a strip-like socket profile (34) which runs radially with respect to the profile channel (12) and has at least at one end a stepped face (35) for receiving the screw element (50, 50_a), which screw element in the rest position lies inside the side contours of the socket profile and in the connecting position projects beyond said socket profile at least on one side and engages in a retaining manner in the undercut space (24) of the other hollow profile (10).

2. Device according to Claim 1, characterized in that the socket profile (34) is fixed to the end face (14) of the hollow profile (10).

3. Device according to Claim 1 or 2, characterized in that the socket profile (34) has a baseplate (36) on a head strip (38) which is of shorter length (g_1) in longitudinal section than the length (g) of the baseplate, and part of the latter projects beyond the end side(s) (39) of the head strip to form an upper or stepped face (35).

4. Device according to any of Claims 1 to 3, characterized in that the screw element (50, 50_a) has a socket strip (52) which is essentially rectangular in plan view, from the surface (51) of which socket strip there projects a screw sleeve or socket sleeve (54) for a screw (63) passing axially through it.

5. Device according to Claim 4, characterized in that the outer contour of the screw sleeve or socket sleeve (54) has two corner edges (56) which are arranged diagonally with respect to its interior (54), from which corner edges a flat wall surface (55) projects on either side as part of the sleeve wall (59), wherein optionally the flat wall surface merges into an arced area (58) of the sleeve wall (59) which is curved in cross section.

6. Device according to Claim 4 or 5, characterized in that the socket strip (52) projects beyond the sleeve wall (59) in its longitudinal axis (E), wherein optionally at least one corner region (53) of the socket strip (52) is shaped as a segment of a circle in plan view.

7. Device according to Claims 4 and 6, characterized in that a rounded corner region (53) of the socket strip (52) is assigned to the corner edge (56) of the sleeve wall (59) (Fig. 9).

8. Device according to Claim 4 or 7, characterized in that the corner edge (56) of the screw sleeve or socket sleeve (54) issues from a longitudinal edge (56) of the socket strip (52).

9. Device according to any of Claims 1 to 8, characterized in that the socket profile (34, 34_a) is passed through by an opening (42) for a screw member (44), said opening being arranged approximately in the centre of its head strip (38), wherein optionally the screw member (44) can be fixed in the profile channel (12) of the hollow profile (10) close to the end face (14) thereof.

10. Device according to Claim 1 or 9, characterized in that the upper or stepped face(s) (35) of the socket profile (34, 34_a) run(s) at a distance from the end face

(14) of the hollow profile (10), which distance corresponds to the height (h_1) of the end side (39) of the head strip (38) and/or to the sum of the thickness (c) of shaped ribs (18) which cover the undercut space (24) and delimit the longitudinal groove (20) and the thickness (c_1) of the socket strip (52).

11. Device according to any of Claims 1 to 10, characterized in that the longitudinal axis (F) of the socket strip (52) of the screw member (50, 50_a) runs parallel to the longitudinal axis (A) of the hollow profile (10) in the inserted position and the socket strip is arranged such that it can be displaced in the longitudinal groove (20).

12. Device according to any of Claims 1 to 11, characterized in that, in order to connect the two hollow profiles (10), the screw members (50, 50_a) of shaped ribs (18) which in the connecting position cover the undercut space (24) of one hollow profile (10) are gripped from below in each case by the socket strips (52) of said screw members, as a result of which the shaped ribs of one hollow profile are held firmly against the end face (14) of the other hollow profile, and in that optionally in the connecting position the longitudinal axis (F) of the socket strip (52) is transverse to the longitudinal axis (A) of the associated hollow profile (10).

13. Device according to any of Claims 1 to 12, characterized by a sleeve (70, 70_a, 70_b) which can be inserted in the longitudinal groove (20), said sleeve having lateral outer ribs (76, 76_a, 76_n) which are designed such that they can be inserted in radial grooves (82) of the hollow profile (10) (Fig. 15), wherein optionally the sleeve (70, 70_a, 70_b) is assigned a clamping screw (84, 84_a) which can be inserted into its interior (72).

14. Device according to any of Claims 1 to 13, characterized in that a longitudinal portion (73) of the interior (72) of the sleeve (70, 70_a, 70_b) is designed as a polygonal cross section, in particular as a hexagonal cross section, and bears against a cylindrical interior portion.

15. Device according to Claim 13 or 14, characterized in that the outer rib (76, 76_a), which is approximately triangular in cross section at least in its free end region, merges with its rib faces (78) into shaped channels (75) of the sleeve peripheral surface (74), and/or in that the two rib faces (78) merge into a rib crest (77, 77_a) which is preferably designed as a sharp edge.

16. Device according to any of Claims 13 to 15, characterized in that the outer rib (76, 76_a, 76_n) has at one end a side edge (79_a) which forms an angle (t) of approximately 45° with a radial line (Q) placed approximately through the centre of the outer rib, wherein optionally the outer rib (76, 76_a) is upset at its inclined side edge (79_a).

17. Device according to any of Claims 13 to 16, characterized by at least three groups (80) of outer ribs (76, 76_a, 76_n) which are parallel to the centre axis (M) of the sleeve (70, 70_a, 70_b) and are assigned to radial grooves (82) in the fixing position, wherein optionally the radial grooves (82) are formed in the groove bottom (24) of the longitudinal groove (20) of the hollow profile (10) and also in facing surfaces of shaped ribs (18) which delimit the longitudinal groove on the profile side face (16).

18. Device according to Claims 16 and 17, characterized in that the side edges (79_a) of a group (80) of outer ribs

(82) are aligned with one another parallel to the centre axis (M).

19. Device according to any of Claims 16 to 18, characterized in that the inclined side edge (79_a) of the outer rib (82) forms a contact resistance between the sleeve (70, 70_a, 70_b) and the associated radial grooves (82).

20. Device for connecting a first extruded hollow profile (10), having a profile channel (12) and at least one undercut groove space (22) on a longitudinal groove (20), to another workpiece by means of a screw element or other connecting member (50, 50_a), in particular device according to at least one of the preceding claims, characterized in that a sleeve (70, 70_a, 70_b) which is inserted in the longitudinal groove (20) is provided with lateral outer ribs (76, 76_a, 76_n) which project from its peripheral surface (74), said ribs being designed such that they can be inserted in radial grooves (82) of the hollow profile (10).

21. Device according to Claim 20, characterized in that the sleeve (70, 70_a, 70_b) is assigned a clamping screw (84, 84_a) which can be inserted into its interior (72), with a round shaft (88) being integrally formed on the screw head (86) of said clamping screw, wherein optionally the round shaft (88) merges into a coaxial screw shaft (90) at a distance (z_3) from the screw head (86).

22. Device according to Claim 21, characterized in that the external diameter (q_1) of the thread (89) or of the screw shaft (90) is greater than the internal diameter (k_1) of the sleeve interior (72).

23. Device according to any of Claims 20 to 22, characterized in that the interior (72) of the sleeve

(70_a, 70_b) has a cylindrical portion which is adjoined by a polygonal cross section (73_a), the axis-parallel edges of which are designed as notched channels (66).

24. Device for connecting an extruded hollow profile (10), having a profile channel (12) and at least one undercut groove space (22) on a longitudinal groove (20), to another workpiece by means of a screw element or other connecting member (50, 50_a, 50_n), in particular device according to at least one of the preceding claims, characterized in that a sleeve (71) which can be inserted in the longitudinal groove (20) is provided with lateral outer ribs (76, 76_a, 76_n) which project from its peripheral surface (74) and also has a clamping screw (85) with thread (90) which can be inserted into its interior (72).

25. Device according to Claim 24, characterized in that the outer ribs (76, 76_a, 76_n) are designed such that they can be inserted in radial grooves (82) of the hollow profile or workpiece (10).

26. Device according to Claim 24 or 25, characterized in that integrally formed on a screw head (86) of the clamping screw (85) is a shaft (88) which is provided with the thread (90) at a distance (z_3) from the screw head, wherein optionally a round portion (89) of the shaft (88) extends between the screw head (86) and the thread (90), the length (z_3) of which round portion corresponds approximately to two-thirds of the length (z_1) of the shaft.

27. Device according to Claim 26, characterized in that the external diameter (q_1) of the thread (90) is greater than the diameter (k_4) of an opening (83) in a rear wall (94) of the sleeve (71) which delimits the sleeve interior (72) and is passed through by the shaft (88).

28. Device according to Claim 26 or 27, characterized in that the thread (90) on the shaft (88) forms an annular edge (92) which faces towards the screw head (86).

29. Device according to Claims 27 and 28, characterized in that the annular edge (92) of the clamping screw (85) forms a stop member, the partner of which is the annular rear wall (94) of the sleeve (71), wherein optionally the clamping screw (85) is arranged such that it can be displaced axially in the sleeve (71) between its screw head (86) and the annular edge (92).

30. Device according to any of Claims 24 to 29, characterized in that, when the screw head (86) of the clamping screw (85) bears against the associated outer sleeve edge (68_t) of the sleeve (71), the thread (90) projects from the sleeve (71) at the other end, and/or in that a longitudinal portion of the interior (72) of the sleeve (71) is designed as a polygonal cross section (73_n), in particular as a hexagonal cross section, and bears against a cylindrical portion of the sleeve interior (72), wherein the axis-parallel edges of the polygonal cross section (73_n) are preferably designed as notched channels (66) and/or the axial length of the cylindrical portion of the sleeve interior (72) corresponds approximately to the length (z_2) of the thread (90) of the clamping screw (85).

31. Device according to any of Claims 27 to 30, characterized in that an axial collar (96) is integrally formed on the sleeve (71) at its end remote from the rear wall (94) and the shaft (88) is arranged such that it can be displaced within said collar, wherein optionally the collar (96) together with the peripheral surface (74) of the sleeve (71) delimits an annular zone (68) of the sleeve (71) and/or the height (h_3) of the collar (96) extends the contact length (y_3) between sleeve (71) and clamping screw (85) of preferably approximately 20.5 mm.

32. Device according to any of Claims 13 to 31, characterized in that the outer rib (76, 76_a, 76_n), which is approximately triangular in cross section at least in its free end region, merges with its lateral rib faces (78) into shaped channels (75) of the sleeve peripheral surface (74), wherein optionally the two rib faces (78) merge into a rib crest (77_n) which is preferably designed as a sharp edge.

33. Device according to any of Claims 13 to 32, characterized in that the outer rib (76, 76_a, 76_n) has at one end a side edge (79_a) which forms an angle (t) of approximately 45° with a radial line (Q) placed approximately through the centre of the outer rib, wherein optionally the outer rib (76, 76_a, 76_n) is upset at its inclined side edge (79_a).

34. Device according to any of Claims 13 to 33, characterized by a plate-like, flat, square body (81) on a side edge (79) of the outer rib (76_n), wherein optionally the plate-like body (81) engages axially over the outer ribs (76_n) on their rib face (78) remote from the collar (96) and/or the inclined side edge (79_a) of the outer rib (76, 76_a, 76_n) forms a contact resistance between the sleeve (70, 70_a, 70_n) and the associated radial grooves (82).

35. Device according to any of Claims 13 to 34, characterized by at least three groups (80) of outer ribs (76, 76_a, 76_n) which are parallel to the centre axis (M) of the sleeve (71) and are assigned to radial grooves (82) in the fixing position, wherein optionally the side edges (79, 79_a) of a group (80) of outer ribs (76, 76_a, 76_n) are aligned with one another parallel to the centre axis (M).

36. Device according to Claim 35, characterized in that the radial grooves (82) are formed in the groove bottom (24) of the longitudinal groove (20) of the hollow profile (10) and also in facing surfaces of shaped ribs (18) which delimit the longitudinal groove on the profile side face (16).

37. Method for producing a device according to at least one of Claims 20 to 36, characterized in that the sleeve (70, 70_a, 70_b, 71) is pushed onto the round shaft (88) of the clamping screw (84_a, 85) and the free end of the round shaft which projects coaxially from the sleeve interior (72, 73_a) is shaped to form a thread, in particular is shaped by rolling-shaping.